



U.S. Department of Transportation
Federal Aviation Administration
Washington, DC

Operational Suitability Report (OSR)

Revision: Original
Date: 03/12/2019

**Universal Avionics Systems Corporation InSight EFI-1040P Avionics
Package STC ST02654LA for the Textron Model 650
CE-650**

Approved by: Small Aircraft Branch
Flight Standardization Board (FSB)
Federal Aviation Administration (FAA)
Aircraft Evaluation Division
901 Locust Street, Room 332
Kansas City, MO 64106

Office Telephone: (816) 329-3238
Office Fax: (816) 329-3241
Office Email: 9-AVS-AFS-100@faa.gov

TABLE OF CONTENTS

Section	Page
RECORD OF REVISIONS	3
1. PURPOSE.....	4
2. APPLICABILITY.....	4
3. HIGHLIGHTS OF CHANGE	4
4. BACKGROUND	4
5. DESCRIPTION.....	5
6. PILOT TYPE RATING	6
7. PROCEDURES FOR USE OF THE INSIGHT EFI-1040P AVIONICS PACKAGE MODIFIED UNDER STC ST02654LA	6
8. OPERATIONAL SUITABILITY.....	6
9. SPECIFICATION FOR TRAINING AND CHECKING	6

RECORD OF REVISIONS

Revision Number	Sections(s)	Page(s)	Date
Original	All	All	03/12/2019

1. PURPOSE

This Operational Suitability Report (OSR) specifies training, checking, and differences requirements applicable to flightcrew members operating Textron Model 650 Citation VII with the Universal Avionics Systems Corporation InSight EFI-1040P avionics package modified under Supplemental Type Certificate (STC) ST02654LA. This report provides guidance to operators under Title 14 of the Code of Federal Regulations (14 CFR) parts 91 and 135, Part 141 Pilot Schools, Part 142 Training Centers, and other training providers.

The Small Aircraft Branch conducted an evaluation of the Textron Model 650 Citation VII aircraft with the Universal Avionics Systems Corporation InSight EFI-1040P avionics package installed. This activity was conducted at the Tucson International Airport (KTUS) in July 2018. The evaluation reviewed operating characteristics and techniques to propose training, checking, and differences requirements applicable to the Textron Model 650 Citation VII aircraft with STC ST02654LA.

2. APPLICABILITY

In accordance with existing 14 CFR, the provisions of this report apply to all operations of a Textron Model CE-650 Citation VII. This report is also applicable to all training and checking conducted in the aircraft. This report is effective until amended, superseded, or withdrawn by subsequent revision.

The guidelines in this report apply to: aviation safety inspectors (ASI) (Operations), Principal Operations Inspectors (POI), Training Center Program Managers (TCPM), Aircrew Program Managers (APM), part 135 air carrier check airmen and instructors, airline transport pilots (ATP) instructing in air transportation service, certificated flight instructors (CFI), aircrew program designees (APD), and Training Center Evaluators (TCE).

3. HIGHLIGHTS OF CHANGE

This is the original OSR for the Textron Model 650 Citation VII with the Universal Avionics Systems Corporation InSight EFI-1040P avionics package modified under STC ST02654LA.

4. BACKGROUND

The Textron Model 650 Citation VII is a twin-engine business jet. The Type Certificate Data Sheet (TCDS) is #A9NM. The aircraft was certified under 14 CFR part 25. It has a maximum takeoff weight (MTOW) of 22,000 pounds and can carry up to 13 passengers. The required crew for this aircraft is two pilots.

The Textron Model 650 Citation VII ceased production in 2000. The aircraft is utilized in parts 91 and 135 operations. Certification of the aircraft predated the Flight Standardization Board (FSB) process, and therefore there is no FSB report for the aircraft.

The Textron Model 650 Citation VII was originally configured with a combination of electromechanical and electronic cathode ray tube (CRT) instruments. The avionics were individually customized to the specifications of the original purchaser. For the purpose of this evaluation, the base aircraft was a Textron Model 650 Citation VII with the combination instrument panel noted above, configured with at least one flight management system (FMS) and associated communication radios. For the purpose of this report, these aircraft will be referred to as Legacy 650s, and aircraft modified by the STC ST02654LA will be designated InSight 650s.

5. DESCRIPTION

The InSight EFI-1040P is a flat panel electronic flight instrument system (EFIS) designed for retrofit into the Legacy 650 in order to replace the electromechanical instruments as well as some aircraft system indications to include engine and fuel indicating instruments. The system updates the Legacy 650s with a flight deck environment that has many modern flat panel all-glass features. The system interface allows easy configuration of flight displays to suit flight conditions and phases of flight or crew preference. Situational awareness to the crew is expanded by incorporating enhanced engine information, charts navigation and mapping terrain, as well as synthetic vision. Display space is adaptable on the primary flight display (PFD) and multifunction display (MFD) so that in the event of screen failure there is little loss of functionality and capability while operating in the reversionary mode.

This modification retains elements of the original avionics installation. The original Traffic Alert and Collision Avoidance System (TCAS) and other non-EFIS systems and controls remain unchanged. The automatic flight control system (AFCS) remains unchanged and retains the original control head. This modification will allow the aircraft to fly coupled lateral navigation (LNAV), vertical navigation (VNAV), and localizer performance with vertical guidance (LPV) approach types. The modification also provides for the option Automatic Dependent Surveillance Broadcast (ADS-B) Out capability if desired.

The aircraft utilized for this demonstration was N650UA S/N 650-7065, a Cessna Citation VII. The left and right seat flight instruments were removed and replaced with the InSight PFD screens and MFD screens. An external reference select panel was installed between engine fire buttons on the brow panel. Two EFIS control display units (ECDU) coupled to dual Universal UNS-1 FMS units as well as dual external cursor control panels were installed on the left and right sides of the center console. This installation included additional InSight options. This aircraft allowed multiple navigational charts and approach plates to be displayed on the EFIS screens as an Electronic Flight Bag (EFB). This feature is referred to as Universal as E-Charts. Additionally, this aircraft utilized an option to allow for aircraft performance data to be calculated and displayed electronically, thus providing the crew with more timely and accurate performance numbers rather than utilizing traditional paper chart performance planning. This feature is referred to as the advanced performance database. Installations utilizing this STC in other aircraft may be configured differently based on operator preferences.

6. PILOT TYPE RATING

The type rating for the Textron Model 650 Citation VII is CE-650. Aircraft configured as an InSight 650 are suitable for use to conduct a practical test to obtain a CE-650 type rating. No modifications to the CE-650 type rating practical test are recommended in reference to this STC.

7. PROCEDURES FOR USE OF THE INSIGHT EFI-1040P AVIONICS PACKAGE MODIFIED UNDER STC ST02654LA

Operators must develop normal, abnormal, and emergency operating procedures from the Universal Avionics Systems Corporation InSight Operator's Manual and the Textron Model 650 Citation VII Airplane Flight Manual (AFM). These procedures must be included in the appropriate approved operator training course when required by 14 CFR.

8. OPERATIONAL SUITABILITY

The Small Aircraft Branch found the InSight EFI-1040P system to be operationally suitable for parts 91 and 135 operations. The E-Chart and advanced performance database options for InSight were found to be to be operationally suitable for parts 91 and 135 operations.

9. SPECIFICATION FOR TRAINING AND CHECKING

In conducting this evaluation, the Small Aircraft Branch utilized factors that are considered the most likely scenario for operators of the InSight 650. The pilot had previous experience in a flat panel (all-glass) aircraft. The pilot received training and passed a practical test in the Legacy 650 aircraft that was equipped with the same FMS system that would be installed in the InSight 650. The pilot held a CE-650 type rating. Differences training was provided by Universal Avionics Systems Corporation that was web-based and included a workbook with proficiency exercises that aligned with the web-based training modules.

Based on the evaluation, the Small Aircraft Branch recommends that differences training between the Legacy 650 and the InSight 650 as Level B training.

Based on the evaluation, the Small Aircraft Branch recommends the differences checking between the Legacy 650 and the InSight 650 as Level B checking.

Legacy 650 crewmembers not having previous flat panel (all-glass) experience or not having proficiency with the installed FMS would require a higher level of training and checking. POIs may contact the Small Aircraft Branch for technical assistance in evaluating training and checking for individual operators that have unique issues not addressed in this report or with any other questions or concerns.